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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/637,086	08/01/2003	Karen M. Taminger	MSC-23518-1	9092
24957	7590	11/30/2005	EXAMINER	
NASA JOHNSON SPACE CENTER MAIL CODE HA 2101 NASA RD 1 HOUSTON, TX 77058			RAO, G NAGESH	
			ART UNIT	PAPER NUMBER
			1722	

DATE MAILED: 11/30/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/637,086	<b>Applicant(s)</b> TAMINGER ET AL.	
	<b>Examiner</b> G. Nagesh Rao	<b>Art Unit</b> 1722	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-59 is/are pending in the application.  
     4a) Of the above claim(s) 59 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-58 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |  |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____  |

*Election/Restrictions*

1. Restriction to one of the following inventions is required under 35 U.S.C.

121:

I. Claims 1-58, drawn to an apparatus, classified in class 425, subclass 174.4.

II. Claim 59, drawn to a process, classified in class 264, subclass 485.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions II and I are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case, the apparatus as claimed can be used to practice another and materially different process such as a process of applying a coating onto a substrate.

3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

4. During a telephone conversation with Theodore U. Ro (by Examiner Leo Tentoni, GAU 1732), applicant's representative, on 27 September 2005 a

provisional election was made without traverse to prosecute the invention of Group I, claims 1-58. Affirmation of this election must be made by applicant in replying to this Office action. Claim 59 is withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

### *Claim Objections*

6. Claims 23-29, 33-35, 43 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The aforementioned claims refer to operational parameters

which limit the recitation of intended use by the device and do not structurally limit the apparatus itself.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
7. Claims 1-10, 14-18, 20-43, 49-50, and 53-58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sterett (US Patent No. 5,787,965) in view of Marcus (US Patent No. 5,306,447) in further view of Rabinovich (US Patent No. 5,578,227).

Sterett 965 pertains to an apparatus for creating a free-form three-dimensional article using a layer by layer deposition. As shown in Figures 1-1c there is a chamber (15) which can be comprised of a vacuum chamber that would inherently be sealed and equipped with a work station positioning system (40), control means (54) which is comprised of a computer software system capable of operating the functions of the device in Sterett 965, the teachings of incorporating a laser system (Col 11 Lines 43-49), and a power system that aids in the operation of the device which would logically follow, considering it would be an inherent aspect of the invention in order to electrically operate the systems comprised within the apparatus (Col 14 Lines 20-30) furthermore the apparatus as seen in Figure 1 shows a framed device with a wall being formed as a result of the frame, and it would inherent that the wall could be comprised of a material such as metal, ceramic, or polymer confluence of materials, as such Sterett 965 teaches that various containment means for enclosing the work space include a flexible shroud, for example PVC (a type of polymer matrix composite) and the like being mounted onto a metal frame (Col 7 Lines 47-60) which by the way is in the shape of rectilinear form (See Figure 1).

Sterett 965 fails to teach the specific incorporation of an electron beam into the apparatus.

Marcus 447 pertains to an apparatus for solid area laser deposition. As shown in Figure 1-9, the apparatus may be comprised of a sealed container (22), an electron beam subsystem (48 and Col 6 Lines 41-50) which would inherently be comprised of at least one focusing coil and deflection coil, a positioning subsystem (Col 13 Lines 7-32), an instrumentation subsystem (60, which as read by applicant's spec is construed as a computer system which by the way inherently comprised of a hardware system and computer screen to visualize the software algorithms runned by the hardware). Furthermore the electron beam laser taught by Marcus 447 teaches a motorized movement system as can be seen in Figure 4, for movement of the electron beam over the platform workspace.

At the time of the invention it would have been obvious to one with ordinary skill in the art to modify the teachings of Sterett 965 with that of Marcus 447 to provide for the laser system that could be used in Sterett 965 with that of an electron beam system in Marcus 447.

The combined hypothetical device of Sterett 965 and Marcus 447 however fail to teach a wire feed subsystem for supplying wire feed to the platform as material being deposited for solid freeform fabrication.

In an apparatus pertaining to rapid prototyping and solid freeform fabrication, teaches the use of a wire feed system, Rabinovich 227 teaches the use of a wire feed system (Col 3 Lines 13-25) in solid freeform fabrication.

At the time of the invention it would have been obvious to one with ordinary skill in the art to incorporate the use of a wire feed system to avoid post curing treatment as taught with the benefits of using a wire feed system as the means of depositing materials onto the platform as taught by Rabinovich 227.

8. Claims 11-13, 19, 44-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sterett (US Patent No. 5,787,965) in view of Marcus (US Patent No. 5,306,447) in further view of Rabinovich (US Patent No. 5,578,227) in further view of Jang (US Patent No. 6,180,049).

From the aforementioned, Sterett 965, Marcus 447, and Rabinovich 227 teach a hypothetical device that reads on applicant's invention. However the teachings fail to explicitly include a pump system in aiding in the operation of the equipment. Although both Sterett 965 and Marcus 447 teach vacuum sealed chamber environments, eluding to a some sort of pump means being necessary since it is well known that vacuum systems operate via a pump means, it does not explicitly teach such a thing.



Therefore in an apparatus pertaining to solid freeform fabrication for layer by layer deposition, Jang 049 teaches one that it is well known to have these pressurized vacuum work chambers (Col 3 Lines 31-44) and secondly the apparatus teaches a pump system to aid in removing excess gas means and as a result would help maintaining the pressurized environment (Col 7 Lines 58-68 and Col 8 Lines 1-20).

At the time of the invention it would have been obvious to one with ordinary skill in the art, to outfit the hypothetical device with a pump system in order to evacuate or pressurize the work chamber at a desired atmospheric pressure and optimal work environment.

9. Claims 51-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sterett (US Patent No. 5,787,965) in view of Marcus (US Patent No. 5,306,447) in further view of Rabinovich (US Patent No. 5,578,227) in further view of Jang (US Patent No. 6,180,049) in further view of Langer (US Patent No. 5,460,758).

The hypothetical device from the aforementioned fails to teach the use of some form of video or digital recording of the work environment.

Langer 758 pertains to another form of solid freeform fabrication where they teach the use of a CCD camera and video equipment to monitor the work

environment and gather data onto an attached computer system to determine optimal layer deposition means for the product worked upon (See Col 2 Lines 22-50).

At the time of the invention it would have been obvious to one with ordinary skill in the art to modify the aforementioned teachings and hypothetical device to include a video recording means in order to aid in optimal manufacturing of the solid freeform product.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to G. Nagesh Rao whose telephone number is (571) 272-2946. The examiner can normally be reached on 9AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on (571) 272-1166. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

GNR

DUANE SMITH  
PRIMARY EXAMINER

*D - [initials]*  
*11-28-05*